TWO NEW SPECIES OF ALLUAUDOMYIA FROM CHEBOYGAN COUNTY MICHIGAN, WITH A NOTE ON THE SYNONYMY OF PARA AND DOWNESI[1]

(DIPTERA, HELEIDAE)

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During the summer of 1954 studies were initiated on the Heleidae of the Douglas Lake region of Cheboygan County, Michigan. Two male specimens, representing two previously undescribed species, of the biting midges of the genus *Alluaudomyia* were taken in recovery cages. The genitalia were so markedly different from any of those discussed by Wirth (1952) in his paper on this genus in North America, and from any species mentioned by Goetghebuer (1933), Kieffer (1925 a, b), de Meillon (1939), de Meillon and Hardy (1953), Okada (1942), Tokunaga (1940 a, b), and Vaillant (1954), that describing these species from single male specimens was felt to be justified.

Although male wings are not as a rule described it seemed advisable to include illustrations and descriptions of these wings since no females were recovered and since the aedeagus of one was somewhat distorted due to folding. The terminology of wing venation follows that of Tillyard's modification of the Comstock-Needham system, a system which has been used by various students of this family in recent years, thus Cu_1 and Cu_2 of some workers become M_{3+4} and Cu_1 respectively, and cell Cu_1 becomes cell M_4. Much of the study was done with 18X eyepieces and a 43X objective.

Alluaudomyia megaparamera, new species

(Figures 1 and 2)

Male.—Length 1.34 mm; wing 1.05 mm; by 0.37 mm. *Wing* (Fig. 1) with costa to 0.495 of wing length. Subcosta not distinct but present, first radial cell closed, second but slightly open. Only two large black spots, one just proximad to the r-m cross vein on and between the radial and medial sectors, darkest on the sectors, the other near the tip of the second radial cell. Nine other somewhat faint darkened areas on veins as follows: veins M_1, M_2, and M_{3+4} each with a darker area on the proximal half and another on the distal half; vein Cu_1 with a central marking; an elongate marking on the medial-cubital sector; a slight marking at the tip of the anal vein. Macrotrichia few along distal anterior border. *Genitalia* (Fig. 2) about as broad as long; ninth sternite more than

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[1] Contribution from the University of Michigan Biological Station.

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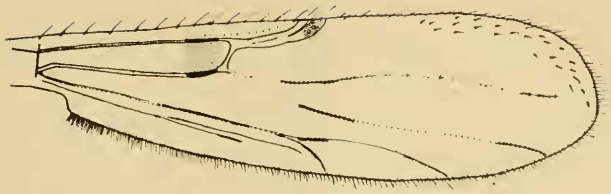
twice as broad as long, depth of mesal excavation less than ½ length of ninth sternite, the posterior membrane spiculate; ninth tergite short and narrow, apicolateral processes appearing as fleshy lobes, broader at base than long, tips at about ⅔ length of basistyles, membrane of ventral face of tergite rather evenly rounded and extending well beyond apicolateral processes. Basistyles somewhat broader at base with prominent, sharply recurved, pointed ventral roots, inner margins slightly concave; dististyles spiculate throughout, strong, subequal to tip, slightly curved, apex with small tooth. Aedeagus a long, slender, tapering arch reaching beyond base of apicolateral processes, basal arms forming about 60° angle with main arch, the ventral surface of the tip is bluntly rounded whereas the dorsal surface terminates in a square-cut end, a highly sclerotized arch crosses the main arch a short distance from the tip, a center strip of this arch appears more highly sclerotized than the borders. Lateral basal apodemes of the parameres rather deeply notched at outer end, a second pair of apodemes, with lateral ends broad and flaired narrow abruptly and pass under the base of the parameres. Parameres exceedingly long, about 2⅓ times as long as the basistyles, divided by a joint into two portions, the basal portion, or stem, as long as the basistyles, broadened laterally at the distal end to form a ledge for the attachment of the distal portion; the distal portion of the parameres directed anteriorly but recurving abruptly at about ¼ their length, gradually tapering and extending well beyond the distal end of the basistyles, terminating in sharp points.

Type.—Holotype ♂, Reese's Bog (just north of Burt Lake), Cheboygan County, Michigan, June 30, 1954, R. W. Williams (recovery cage). Type in U.S.N.M.

Of the species found in North America *megaparamera* appears to be more closely related to *parva* than to any other. In both, the genitalia are broader than long, the posterior membrane is spiculate and the ninth tergite is relatively small. However, in *megaparamera* the arch of the aedeagus possesses prominent basal arms and is much longer and more narrow with a sclerotized arch near the tip, two pairs of apodemes are present near the base of the parameres and the parameres themselves are unique in that they are composed of two semi-equal regions or segments the total length of which is about 2⅓ times the length of the basistyles.

Alluaudomyia wirthi, new species
(Figues 3 and 4)

Male.—Length 1.40 mm; wing 1.08 mm. by 0.38 mm. *Wing* (Fig. 4) with costa to 0.518 of wing length. Subcosta barely visible under proper lighting, first radial cell closed, second fairly widely open. Five dark spots on the wing; of the two larger spots one lies proximad to the r-m cross vein on and between the radial and medial sectors and the other at the tip of the second radial cell (this spot may appear as two separate spots, one at the tip of vein R_{4+5}, the other lying just below, barely touching it); vein M_2 with a prominent spot on the proximal half and cell M_2 with a somewhat smaller lighter spot which lies below and slightly behind the large dark spot proximal to the r-m cross vein; the anal vein has a darkened area at the tip. Macrotrichia very sparse, a few



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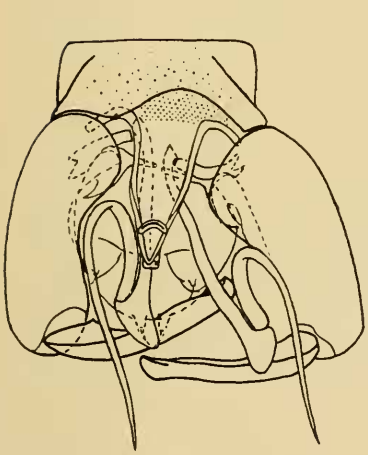

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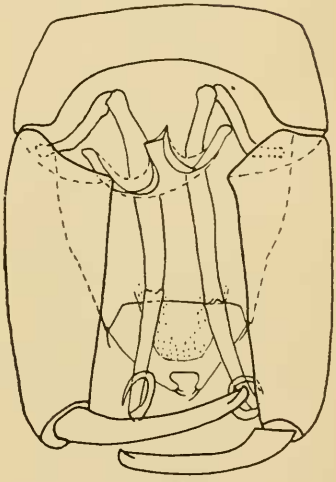

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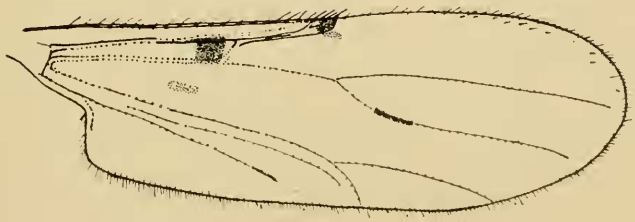

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Allaudomyia megaparamera n. sp.: fig. 1, male wing; fig. 2, male genitalia. *A. wirthi* n. sp.: fig. 3, male genitalia; fig. 4, male wing.

on distal anterior border. *Genitalia* (Fig .3) about ¼ longer than broad. Ninth sternite more than twice as broad as long, the posterior excavation is apparently rounded (somewhat difficult to see in this single specimen) going halfway to base, the membrane not spiculate; ninth tergite with distal third subparallel, the apicolateral processes about ¼ as long as the distance between their bases, membrane on ventral face of tergite ends well beyond the apicolateral processes and has a mesal spiculate area. Basistyles subparallel, about 2.8 times as long as broad; distyles slender, slightly incurved, the proximal half somewhat more densely pilose. Aedeagus (artificially folded in this specimen as indicated in Fig. 3) with basal arch about one-half of total length, tip square-cut, ventral surface slightly concave. Parameres with lateral basal apodemes originating within base of basistyles, bent at 40-60° angle at proximal third to fourth, spiculate stems with the somewhat bulbous base extending well below base of basistyles and extending distad nearly to the tip of the basistyles where there is an apparent joint terminated by a second segment or filament which is short, recurved and sharply pointed.

Type.—Holotype ♂, Smith's Bog, Cheboygan County, Michigan, July 27, 1954, R. W. Williams (recovery cage). Type in U.S.N.M.

The genitalia of *wirthi* displays some resemblance to *bella* and some to *needhami*. It can, however, readily be separated from either of these species by its distinctive aedeagus and parameres, absence of spicules on the ninth sternite and rather long membrane on the ventral face of the ninth tergite which has a spiculated mesal area. I am pleased to name this species after Dr. Willis W. Wirth who has been so extremely helpful to me in many ways during my study of heleids from various parts of North America.

Note on the Synonymy of **Alluaudomyia parva** and **A. downesi**

Wirth (1952) described *Alluaudomyia downesi* from a single female specimen and stated that it was closely allied to *parva*. Since the male of *megaparamera* appeared to be more closely related to *parva* than to any other North American species the possibility existed that it might be the male of *downesi*. Communication with Dr. Wirth concerning this possibility disclosed that he had later collected a male of *parva* from the type locality of *downesi* and that he now feels that the female he described as *downesi* actually represented a variation within the species *parva*. After studying specimens from all available localities I concur with Dr. Wirth that this is probably the case and at his suggestion am including this brief paragraph on this synonymy.

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BOOK NOTICE

AQUATIC INSECTS OF CALIFORNIA, With Keys to North American Genera and California Species, Edited by Robert L. Usinger. University of California Press, Berkeley. 1956. 576 pp., index, many illustrations. Price $10.00.

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